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Black et al.

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(54) **ELECTRICAL POWER OUTLET**

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(21) Appl. No.: **14/312,755**

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Related U.S. Application Data

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(60) Provisional application No. 61/580,854, filed on Dec. 28, 2011, provisional application No. 61/490,502, filed on May 26, 2011.

(51) **Int. Cl.**
H01R 13/66 (2006.01)
H01R 13/74 (2006.01)

(52) **U.S. Cl.**
CPC ***H01R 13/748*** (2013.01)

(58) **Field of Classification Search**
CPC H01R 13/60; H01R 12/716
USPC 439/535
See application file for complete search history.

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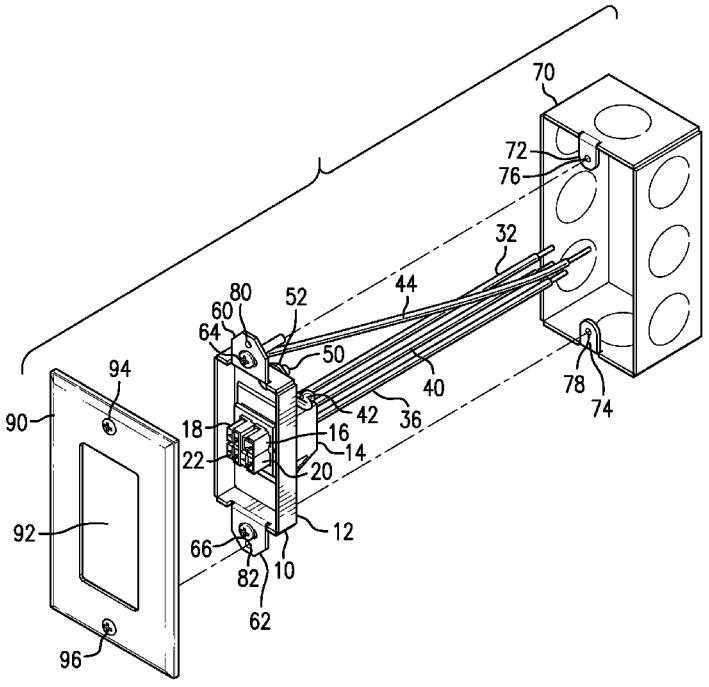
(74) *Attorney, Agent, or Firm* — Raymond A. Nuzzo

(57) **ABSTRACT**

An electrical power outlet having an outlet box and an electrical connector insert attached to the outlet box. The electrical connector insert has a frame and a powerpole connector assembly attached to the frame. The powerpole connector assembly has a plurality of powerpole connectors. The electrical power outlet includes a face plate that is attached to the frame of the electrical connector insert. The faceplate has an opening through which the powerpole connectors protrude. In one embodiment, the plurality of powerpole connectors has four powerpole connectors arranged in two columns, wherein each column has two powerpole connectors. The opening in the face plate is substantially rectangular in shape. In a preferred embodiment, the face plate is configured as a Decora® style face plate.

5 Claims, 7 Drawing Sheets



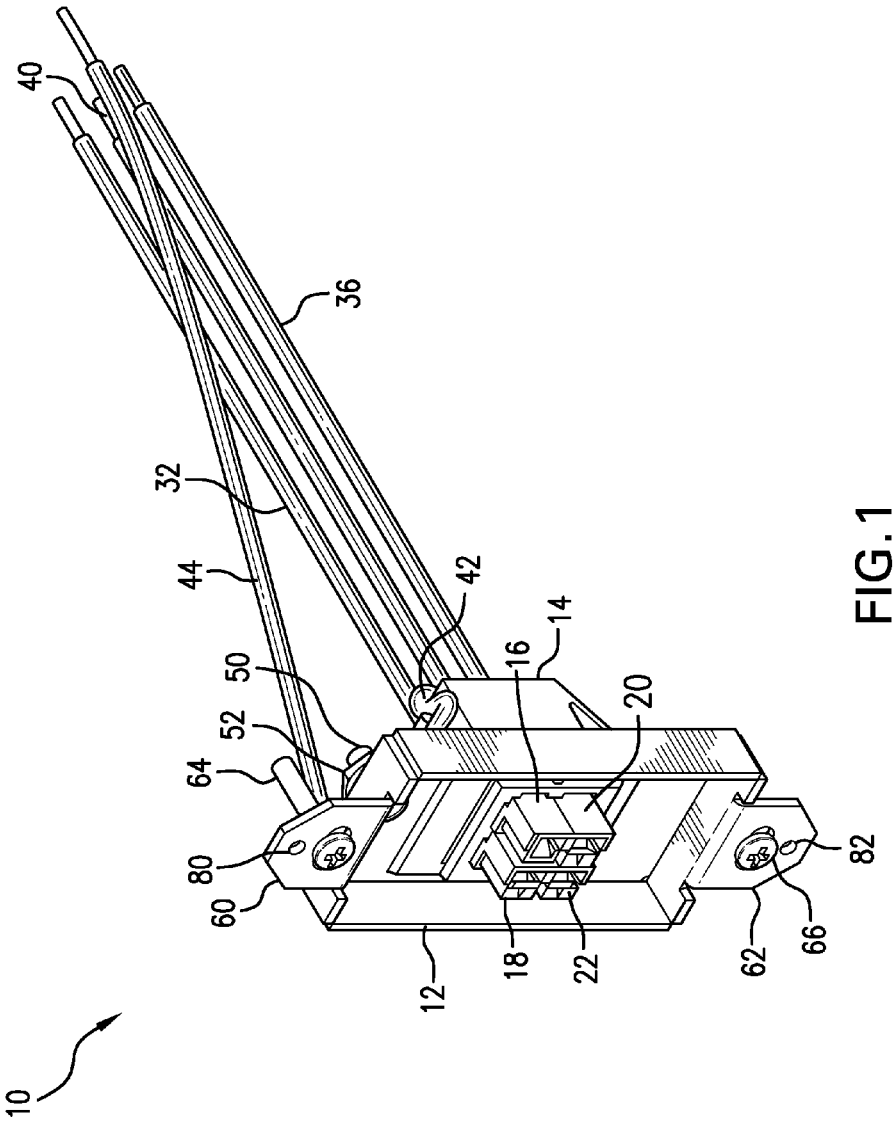


FIG. 1

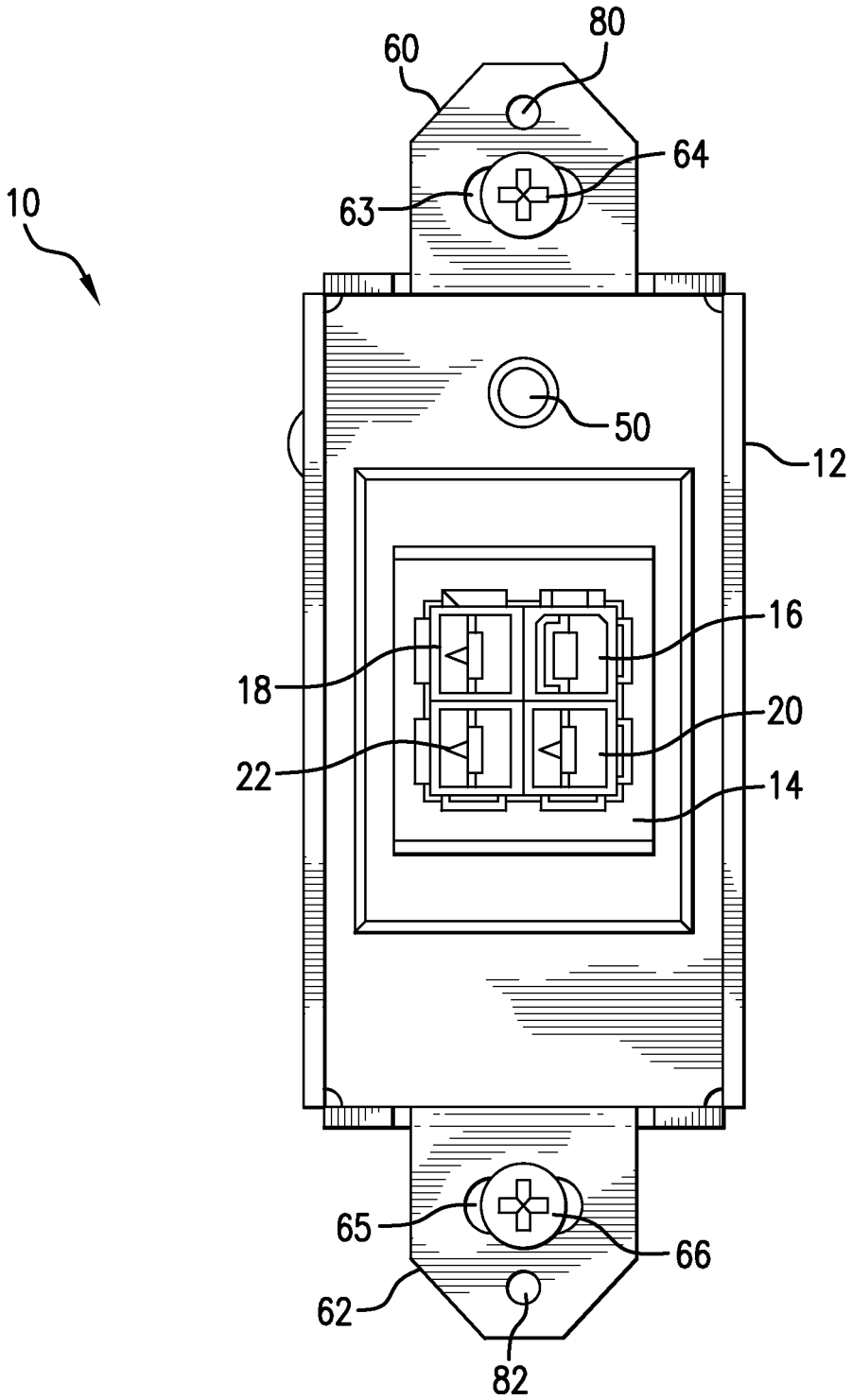


FIG. 2

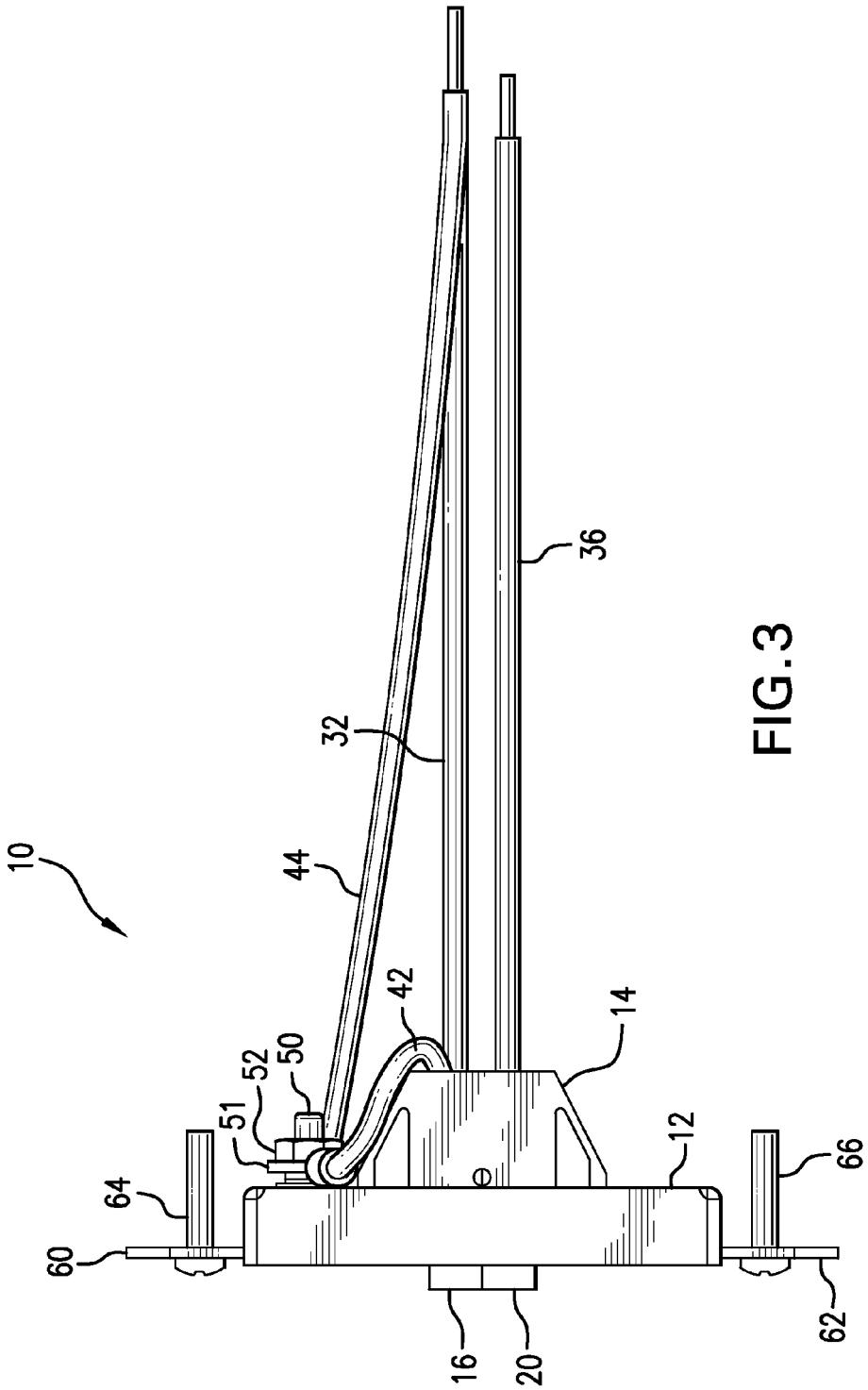


FIG. 3

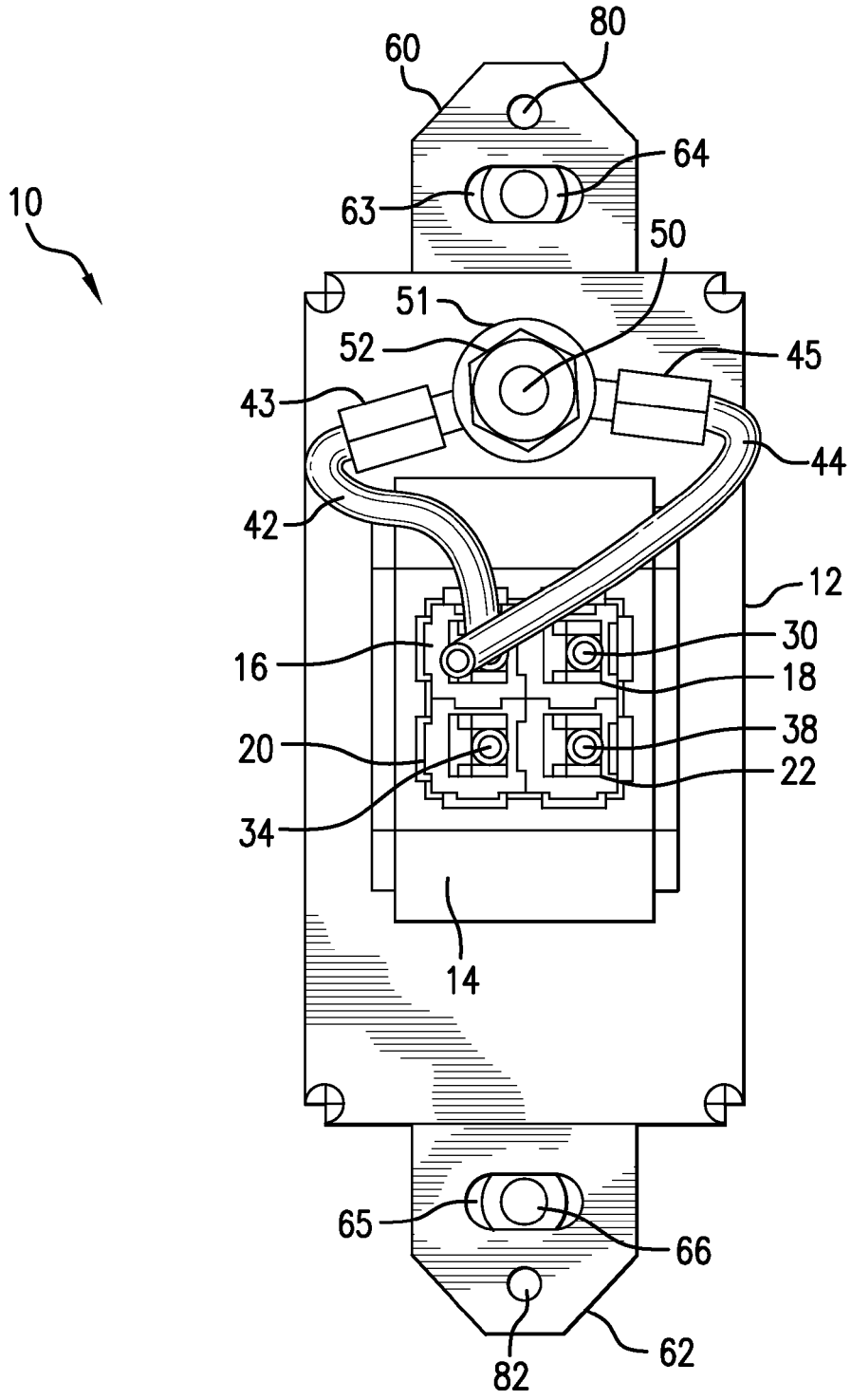

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FIG.4

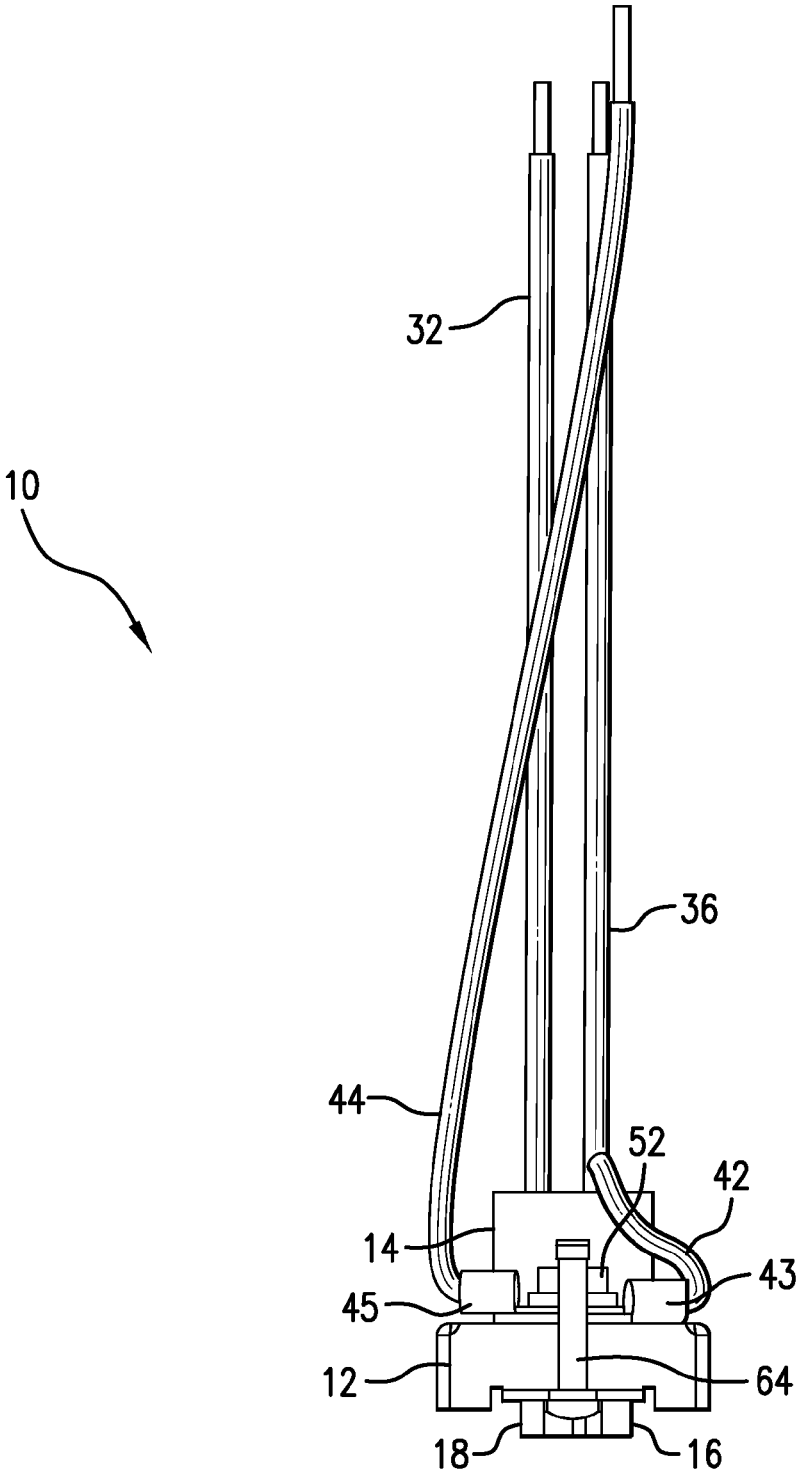

FIG.5

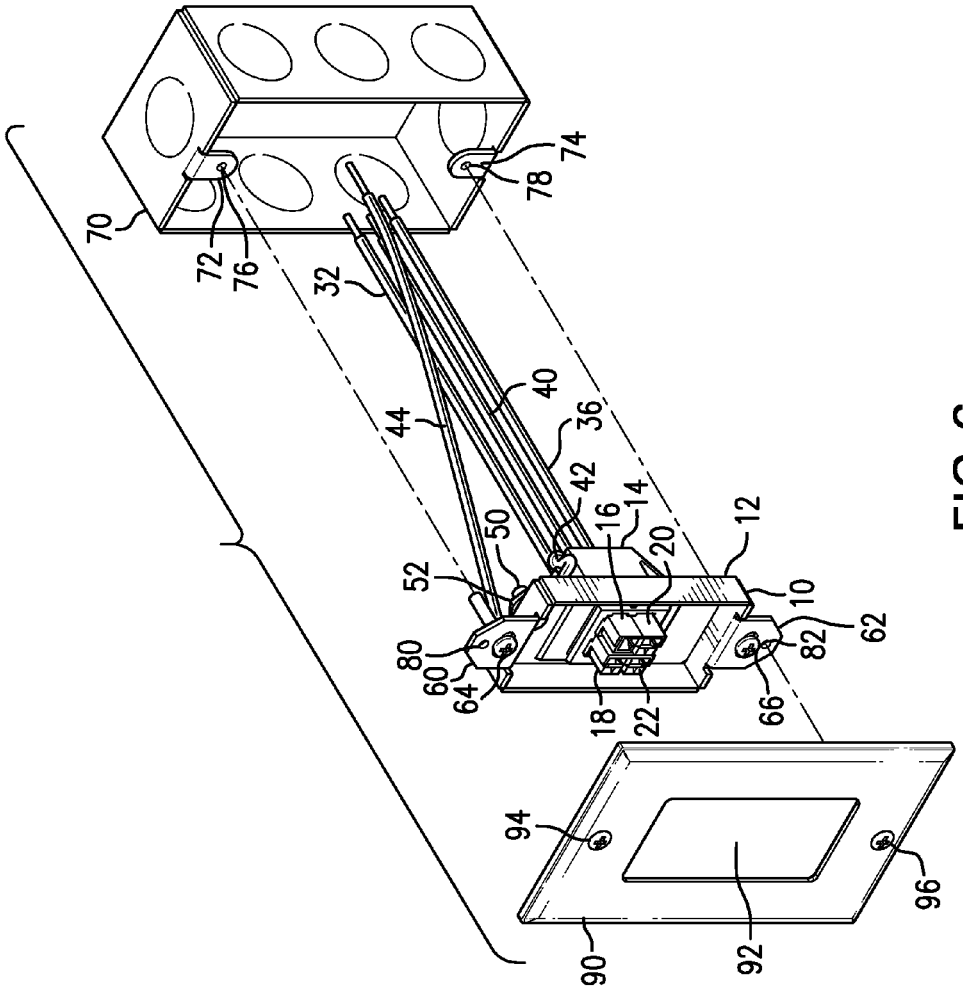
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FIG.6

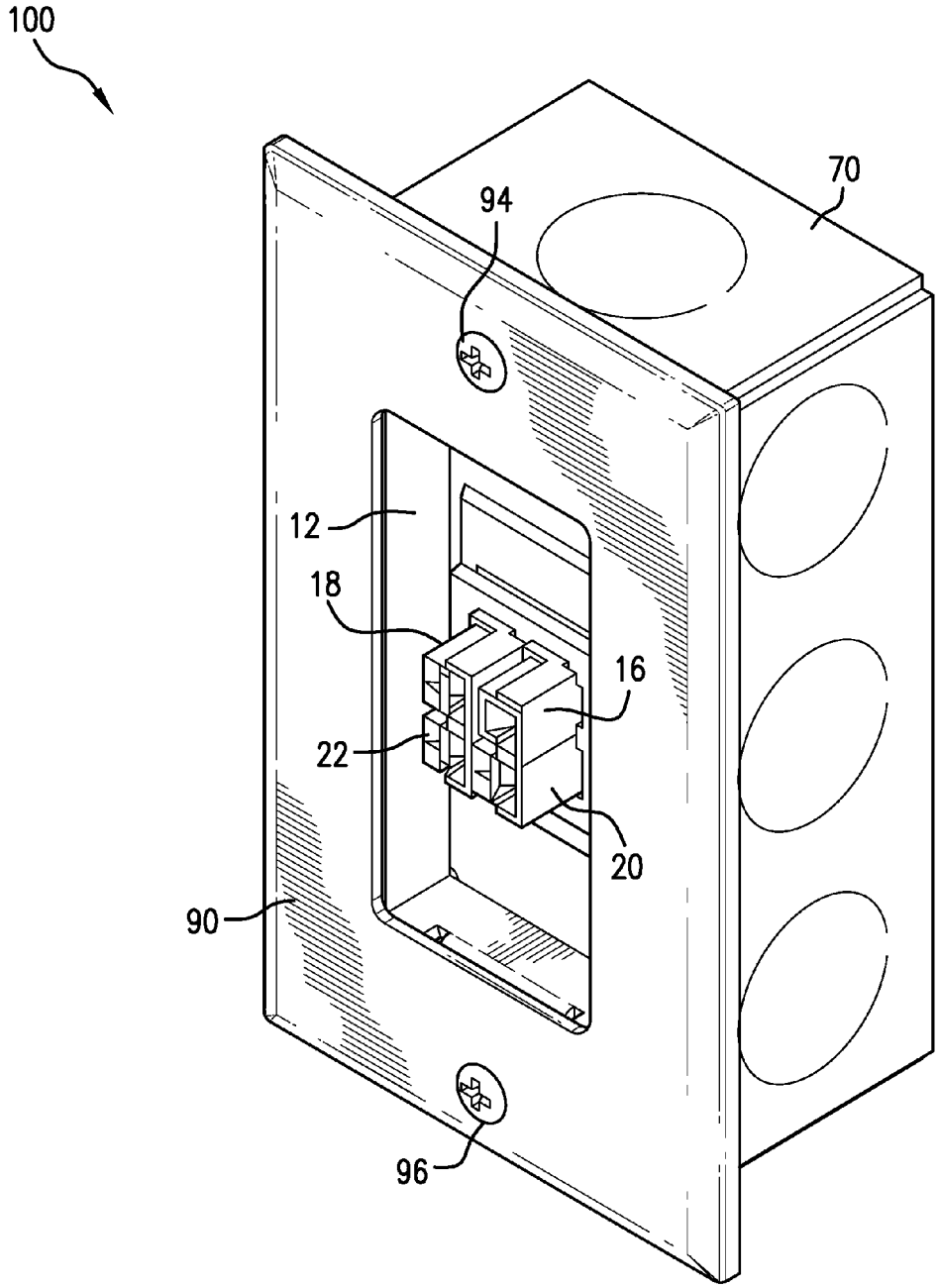

FIG.7

ELECTRICAL POWER OUTLET

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation of U.S. application Ser. No. 13/476,979, filed May 21, 2012, which application claims the benefit of U.S. provisional application No. 61/490,502, filed May 26, 2011, and U.S. provisional application No. 61/580,854, filed Dec. 28, 2011. The entire disclosure of U.S. application Ser. No. 13/476,979 is hereby incorporated by reference.

BACKGROUND OF THE INVENTION

The present invention relates to electrical power outlets that provide voltages, such as AC voltages, that can be used to power equipment or machinery.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a new electrical power outlet that has the capability to provide a plurality of different voltages.

In one aspect, the present invention is directed to an electrical power outlet comprising an outlet box and an electrical connector insert attached to the outlet box. The electrical connector insert comprises a frame and a powerpole connector assembly attached to the frame. The powerpole connector assembly comprises a plurality of powerpole connectors. The electrical power outlet further comprises a face plate that is attached to the frame of the electrical connector insert. The faceplate has an opening through which the powerpole connectors protrude. In one embodiment, the plurality of powerpole connectors comprises four powerpole connectors arranged in two columns, wherein each column has two powerpole connectors. The opening in the face plate is substantially rectangular in shape. In a preferred embodiment, the face plate is configured as a Decora® style face plate.

Other objects and advantages of the present invention will be apparent in view of the ensuing description of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Although the scope of the present invention is much broader than any particular embodiment, a detailed description of the preferred embodiments follows together with illustrative figures, wherein like reference numerals refer to like components, and wherein:

FIG. **1** is a perspective view of an electrical connector insert that is part of the electrical power outlet of the present invention;

FIG. **2** is a front view of the electrical connector insert shown in FIG. **1**;

FIG. **3** is a side view, in elevation, of the electrical connector insert shown in FIG. **1**;

FIG. **4** is a rear view of the electrical connector insert of FIG. **1**;

FIG. **5** is a top view of the electrical connector insert of FIG. **1**;

FIG. **6** is an exploded view, in perspective view, of the electrical power outlet of the present invention; and

FIG. **7** is a perspective view of the completely assembled electrical power outlet of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIGS. **1-5**, there is shown electrical connector insert **10** that is part of the electrical power outlet of the present invention. Electrical connector insert **10** comprises frame **12** and electrical connector assembly **14**. Electrical connector assembly **14** comprises a plurality of electrical connectors **16**, **18**, **20** and **22**. Electrical connector assembly **14** is connected to frame **12**. Specifically, frame **12** has a generally central opening in which is located electrical connector assembly **14** such that electrical connectors **16**, **18**, **20** and **22**, protrude outward. Any suitable technique may be used to connect electrical connector assembly **14** to frame **12**.

In accordance with the invention, electrical connector assembly **14** is configured as a Powerpole® connector assembly manufactured by Anderson Power Products, Inc. of Sterling, Mass. A powerpole connector assembly is described and shown in U.S. Pat. No. 7,004,795 entitled "Powerpole Connector Assembly And Method Therefor", the disclosure of which patent is hereby incorporated by reference. A powerpole connector is also shown in U.S. Pat. No. D604,246, entitled "Electrical Connector", the disclosure of which patent is hereby incorporated by reference. The mark "Powerpole" is a trademark owned by Anderson Power Products, Inc. and is known in the art. In accordance with the invention, each electrical connector **16**, **18**, **20** and **22** is configured as a "Powerpole" connector (or "powerpole").

Each electrical connector, or Powerpole connector, provides either a ground connection or a specific voltage. For example, in one embodiment, electrical connector **16** provides a connection to electrical ground, electrical connector **18** provides 24 VAC (volts alternating current), electrical connector **20** provides 72 VAC, and electrical connector **22** provides 80 VAC. It is to be understood that these voltages are just examples. Referring to FIG. **4**, there is shown a rear view of electrical connector insert **12**. Each electrical connector **16**, **18**, **20** and **22** has a wire receiving channel for receiving a corresponding electrical wire. Once the wire is inserted into the wire receiving channel, it is locked in place. Specifically, electrical connector **18** has wire receiving channel **30** for receiving wire **32** (see FIG. **1**). Electrical connector **20** has wire receiving channel **34** for receiving wire **36**. Similarly, electrical connector **22** has wire receiving channel **38** for receiving wire **40**. Electrical connector **16** has a wire receiving channel, that is not shown, but which receives wire **42**. Wire **42** is also connected to frame **12**. Wire **42** includes ring terminal **43**. Thus, in this embodiment, electrical connector **16** is connected to ground. Wire **44** is also connected to frame **12**. Wire **44** includes ring terminal **45**. Frame **12** includes PEM stud **50**, tooth washer **51** and nut **52**. Ring terminals **43** and **45** are positioned on PEM stud **50**. Tooth washer **51** is positioned on PEM stud **50** and over ring terminals **43** and **45**. Nut **52** is then threaded on PEM stud **50** and tightened to create a high-integrity ground connection. Frame **12** includes extending portions **60** and **62**. Extending portion **60** has an opening **63** for receiving screw **64**. Similarly, extending portion **62** has an opening **65** for receiving screw **66**. As shown in FIG. **6**, the electrical power outlet of the present invention includes outlet box **70** which is well known in the art. Outlet box **70** is typically connected to a structure (not shown) such as a wall, post, support beam, etc. Outlet box **70** can also be attached to a table, work bench or other article of furniture, or to a machine. Outlet box **70** includes portions **72** and **74** which have threaded openings **76** and **78**, respectively. Threading openings **76** and **78** are configured to receive screws **64** and **66**, respectively, thereby allowing electrical

connector insert **10** to be fastened to outlet box **70**. Electrical wires (not shown) carrying specific voltages are connected to wires **32**, **36** and **40** within outlet box **70**. An additional electrical wire (not shown), which is connected to ground, is connected to wire **44** within outlet box **70**.

As shown in FIG. **6**, portion **60** of frame **12** includes threaded opening **80** and portion **62** of frame **12** includes opening **82**. The electrical power outlet of the present invention further comprises face plate **90**. Face plate **90** has an opening **92** which has a size that allows access to electrical connectors **16**, **18**, **20** and **22**. In a preferred embodiment, opening **92** is substantially rectangular. Face plate **90** includes screws **94** and **96** that are configured to be screwed into threaded openings **80** and **82**, respectively, of frame **12**. In a preferred embodiment, face plate **90** is configured as a Decora® style face plate. Referring to FIG. **7**, there is shown completely assembled electrical power outlet **100** of the present invention.

The principles, preferred embodiments and modes of operation of the present invention have been described in the foregoing specification. The invention which is intended to be protected herein should not, however, be construed as limited to the particular forms disclosed, as these are to be regarded as illustrative rather than restrictive. Variations in changes may be made by those skilled in the art without departing from the spirit of the invention. Accordingly, the foregoing detailed description should be considered exemplary in nature and not limited to the scope and spirit of the invention as set forth in the attached claims.

What is claimed is:

1. An electrical power outlet apparatus, comprising:

an outlet box;

an electrical connector insert removably attached to the outlet box, the electrical connector insert comprising a frame and a powerpole connector assembly attached to the frame, wherein the powerpole connector assembly has only four powerpole connectors that are arranged in two columns wherein each column has two powerpole connectors and wherein each powerpole connector has an internal electrical contact and a rear, wire receiving channel for receiving and locking in place a corresponding electrical wire, each powerpole connector being configured to be mated to a complementary powerpole connector; and

a plurality of electrical wires, each electrical wire having an end that is disposed through and locked in place within a corresponding wire receiving channel and electrically connected to the corresponding electrical contact.

2. The electrical power outlet apparatus according to claim **1** wherein one of the plurality of wires is electrically connected to the frame so as to electrically connect one of the powerpole connectors to electrical ground.

3. An electrical power outlet apparatus, comprising:

an electrical connector insert configured to be attached to an outlet box, the electrical connector insert comprising a frame and a powerpole connector assembly attached to the frame, wherein the powerpole connector assembly has only four powerpole connectors that are arranged in two columns wherein each column has two powerpole connectors and wherein each powerpole connector has an internal electrical contact and a rear, wire receiving channel for receiving and locking in place a corresponding electrical wire, each powerpole connector being configured to be mated to a complementary powerpole connector; and

a plurality of electrical wires, each electrical wire having an end that is disposed through and locked in place within a corresponding wire receiving channel and electrically connected to the corresponding electrical contact.

4. The electrical power outlet apparatus according to claim **3** further comprising means for removably attaching the electrical connector insert to an outlet box.

5. The electrical power outlet apparatus according to claim **3** further comprising a face plate removably attached to the frame of the electrical connector insert, the faceplate having an opening through which the pole connectors protrude.

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